EVALUATION OF SURGICAL TREATMENT OF PERIODONTAL POCKETS WITH Nd:YAG LASER

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The aim of the study was to compare the effect of surgical treatment with Nd:YAG laser versus that of conventional reverse bevelled flap (RBF) in adult patients with severe periodontitis. Patients were subjected to a hygienic phase, including oral hygiene instructions, professional supra- and subgingival scaling. At baseline after 4 weeks, 14 patients who presented at least 2 sites in per quadrant with a pocket depth (PPD) ≥ 6mm in two quadrants of the mouth, were included in the study. At these sites, PPD, clinical attachment level (CAL), proportions of sites per quadrant with plaque (PL-Score), or bleeding on probing (BL-Score) were recorded by one investigator. Then, in one randomly chosen quadrant, RBF was performed at sites with PPD ≥ 6 mm under local anesthesia by another investigator. In the other quadrant, gingival tissue was excised at sites with PPD ≥ 6 mm with the Nd:YAG Genius laser (Mølsgaard Dental, Copenhagen, Denmark) without local anesthesia in all, except 4 patients. Laser parameters were: power - 7 W, pulse width - 250 microseconds, frequency - 50 Hz, water spray - 4 and air spray - 5. No suturing was needed after laser surgery. Following surgeries, patients performed mouth rinsing with 0.2% chlorhexidine for a week. After 3 and 6 months, PPD, CAL, PL-Score and BL-Score were recorded “blindly” at the treated sites.

Results revealed that both treatments showed similar (p>0.05, paired t-test) improvement of all clinical parameters at 3 and 6 months. RBF resulted in significant (p<0.001, paired t-test) reduction of the initial PPD (mean ± SD, mm) at 3 and 6 months (3.1±0.8 and 2.8±0.7, respectively). This was similar (p>0.05) to 2.6±0.7 and 2.4±0.6, observed after laser surgery at the same healing periods. At 3 and 6 months, CAL-gain (mean ± SD, mm) was 1.8±1.2 and 1.5±1.0 following RBF, while 1.6±1.0 and 1.6±0.7 following laser surgery. At 3 and 6 months, BL-Score was significantly decreased from 0.67 to 0.27 and 0.43 after RBF, and from 0.68 to 0.31 and 0.25 after laser surgery. PL-Score was significantly (p<0.001, paired t-test) decreased only after laser surgery at 6 months. Postsurgical pain was found in 1 patient (<1%) after laser treatment, whereas in 7 patients (50%) after RBF. Postsurgical swelling occurred in 8 patients (57%) only after RBF. At the end of the study, all patients chosen laser surgery as a preferable treatment. In conclusion, Nd:YAG laser surgery resulted in improvement of all clinical parameters in deep periodontal pockets, similarly to conventional periodontal surgery. However, postsurgical complications were lower following laser surgery.
### Mean (± SD) changes in PPD (mm)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>PPD-0</th>
<th>PPD-3</th>
<th>PPD-6</th>
<th>ΔPPD 0-3</th>
<th>ΔPPD 0-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBF</td>
<td>6.5±0.5</td>
<td>3.5±1.0</td>
<td>3.7±0.8</td>
<td>3.1±0.8</td>
<td>2.8±0.7</td>
</tr>
<tr>
<td>Laser</td>
<td>6.2±0.4</td>
<td>3.6±0.8</td>
<td>3.8±0.7</td>
<td>2.6±0.7</td>
<td>2.4±0.6</td>
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</table>

### Mean (± SD) changes in CAL (mm)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>CAL-0</th>
<th>CAL-3</th>
<th>CAL-6</th>
<th>ΔCAL 0-3</th>
<th>ΔCAL 0-6</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBF</td>
<td>8.1±1.3</td>
<td>6.4±1.6</td>
<td>6.6±1.4</td>
<td>1.8±1.2</td>
<td>1.5±1.0</td>
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<tr>
<td>Laser</td>
<td>7.9±1.4</td>
<td>6.3±1.9</td>
<td>6.4±1.7</td>
<td>1.6±1.0</td>
<td>1.6±0.7</td>
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</tbody>
</table>

### Mean values (± SD) of the Bleeding Score and Plaque Score

<table>
<thead>
<tr>
<th>Treatment</th>
<th>BLS-0</th>
<th>BLS-3</th>
<th>BLS-6</th>
<th>PLS-0</th>
<th>PLS-3</th>
<th>PLS-6</th>
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</thead>
<tbody>
<tr>
<td>RBF</td>
<td>.67±.40</td>
<td>.27±.30</td>
<td>.43±.31</td>
<td>.13±.24</td>
<td>.16±.26</td>
<td>.30±.34</td>
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<tr>
<td>Laser</td>
<td>.68±.33</td>
<td>.31±.29</td>
<td>.25±.23</td>
<td>.22±.35</td>
<td>.16±.24</td>
<td>.08±.14</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>N of patients</th>
<th>Smokers</th>
<th>Pain TR Laser</th>
<th>Pain AFT Laser</th>
<th>Pain TR RBF</th>
<th>Pain AFT RBF</th>
<th>Swelling RBF</th>
<th>Swelling Laser</th>
<th>Prefer Laser</th>
</tr>
</thead>
<tbody>
<tr>
<td>N of patients</td>
<td>10</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>0</td>
<td>8</td>
<td>14</td>
</tr>
<tr>
<td>%</td>
<td>71%</td>
<td>29%</td>
<td>&lt;1%</td>
<td>0%</td>
<td>50%</td>
<td>0%</td>
<td>57%</td>
<td>100%</td>
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